UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,596	03/07/2002	Peter Magnus Petersson	2380-592	7687

7590 01/25/2005	**EXAMINER**
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ART UNIT	PAPER NUMBER
2685	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/091,596	PETERSSON ET AL.
	Examiner	Art Unit
	THUAN T. NGUYEN	2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 17-37* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 17-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>07 March 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　Paper No(s)/Mail Date <u>3/7/02 & 1/28/03</u>.

4) ☐ Interview Summary (PTO-413)
　Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Remark

1.   Claims 10-16 were canceled without prejudice. Pending claims are 1-9, and 17-

34. new dependent claims 35-37 are added.

Claim Rejections - 35 USC 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> *A person shall be entitled to a patent unless --*
> *(b) the invention was patented or described in a printed publication in this or a foreign*
> *country or in public use or on sale in this country, more than one year prior to the date of*
> *application for patent in the United States.*

3.   Claims 1-9, and 17-34 are rejected under 35 U.S.C. 102(b) as being anticipated by

Schick et al. (U.S. Patent No. 5,970,053).

Regarding claim 1, Schick discloses an apparatus (Fig. 1) comprising:

a mixer for mixing a received signal and a local oscillator signal and generating an

analog, frequency converted signal (Fig. 1, item 168 for a mixer in mixing a received signal from

program source signal 102-1…102-83 and a local signal oscillator (LO) from LO 170 to analog

frequency converted signal or frequency modulated signal –with modulators 116-1 to 116-83,

see col. 4/line 58 to col. 5/line 19 and col. 6/line 28 to col. 7/line 34), and

an analog-to-digital converter for converting the analog, frequency-converted signal into

a corresponding digital signal (Fig. 1/item ADC 192 for analog-to-digital converter for

converting analog frequency converted signals to corresponding digital signals, see col. 8/lines

43-67);

wherein a frequency of the local oscillator signal is an integer multiple of half of a

sampling rate of the analog-to-digital converter, i.e., this is from the Nyquist theorem principal as

the minimum sampling rate should be at least TWICE that of the highest frequency component

of the signal being sampled to avoid aliasing (col. 6/lines 52-67 and col. 10/lines 1-26 for

examples of the frequency of the local oscillator signal is an integer multiple of half of a

sampling rate of the analog-to-digital converter, see equation 7 as F fund (fundamental or

reference frequency) considering for Frequency from the LO is 6 MHz (half of the sampling

rate), while F sync for sampling rate is 12 MHz (twice) with I/J is a coefficient for integers).

For claims 2 and 3, in view of claim 1, Schick discloses "wherein the frequency of the

local oscillator signal is one half of the sampling rate of the analog-to-digital converter" and

"wherein the frequency of the local oscillator signal F LO is F LO = n * F ADC/2, where F ADC

is the sampling rate of the analog-to-digital converter, and n is a positive integer", i.e., this is

from the Nyquist theorem principal as the minimum sampling rate should be at least TWICE that

of the highest frequency component of the signal being sampled to avoid aliasing (col. 6/lines

52-67 and col. 10/lines 1-26 for examples of the frequency of the local oscillator signal is an

integer multiple of half of a sampling rate of the analog-to-digital converter, see equation 7 as F

fund (fundamental or reference frequency) considering for Frequency from the LO is 6 MHz

(half of the sampling rate), while F sync for sampling rate is 12 MHz (twice) with I/J is a

coefficient for integers).

For claim 4, in view of claim 1, Schick further discloses "comprising: an oscillator for

generating a periodic signal, wherein the periodic signal is used to generate both the local

oscillator signal and a sampling rate signal for the analog-to-digital converter" (Fig. 1, item 170,

and col. 6/line 52 to col. 7/line 54 for LO 170 and corresponding PLL in providing S LO, S RF

and S IF , or other words, LO in generating the periodic signal is used to generate both the local

oscillator signal and a sampling rate signal for the analog-to-digital converter ADC 192).

For claim 5, in view of claim 4, Schick further discsloses "comprising: a frequency

changer, receiving the periodic signal from the oscillator, for providing the local oscillator signal

to the mixer and a sampling rate signal to the analog-to-digital converter" (Fig. 1/item 208 and

col. 10/lines 1-50 for a frequency divider in changing the frequency and under the control of LO

170 in providing the local oscillator signal 170 to the mixer 168 and a sampling rate signal to the

analog-to-digital converter ADC 192, and Fig. 8 is a closer up view of frequency divider 208).

For claim 6, in view of claim 5, Schick discloses "wherein the frequency changer

includes a first frequency divider for dividing the periodic signal in half to generate the local

oscillator signal and for dividing the periodic signal by an integer to generate the sampling rate

signal of the analog-to-digital converter" (Fig. 8 for a frequency divider circuit, and claim 1

above again for dividing the periodic signal in half to generate the local oscillator signal and for

dividing the periodic signal by an integer to generate the sampling rate as explained above).

For claim 7, in view of claim 1, Schick suggests "wherein the apparatus is used in a

receiver without a filter between the mixer and the analog-to-digital converter", i.e., although a

filter 182 is included, yet Schick notes that it is only preferable to (have filter) have ample

attenuation to ensure that aliased signal levels is below a defined bit-weight of ADC, this

suggests an option in including the filter based on ADC's type and designing configuration of the

receiver (col. 8/line 58 to col. 9/line 19).

For claim 8, in view of claim 1, Schick discloses "wherein the apparatus is used in a receiver with a filter between the mixer and the analog-to-digital converter" (Fig. 1/item 182 for a filter between the mixer 168 and ADC 192, referred to col. 9/lines 1-19 again).

For claim 9, in view of claim 1, Schick discloses "wherein the analog, frequency-converted signal from the mixer is coupled directly to the analog-to-digital converter" (as shown in Fig. 1, analog converted signal from mixer 168 is summing at 190 and coupled directly to ADC 192).

For claim 33, Schick further teaches "comprising: determining a receive frequency band for the received signal and a sampling rate range for the analog to digital conversion; defining limits for the frequency of the local oscillator signal in accordance with the receive frequency band and the frequency of the sampling signal in accordance with the sampling rate range; and selecting, within the defined limits, the frequency of the local oscillator signal and the frequency of the sampling rate signal so that the frequency of the local oscillator signal is an integer multiple of half of the frequency of the sampling rate signal" (col. 9/lines 20-33, and col. 10/line 1 to col. 11/line 38 for defined sampling windows for sampling rate ranges, and importantly, based on Nyquist criteria, all attributes and frequency configurations must be defined and limited within a limit to avoid aliasing as noted above).

For claim 35 (new), in view of claim 1, Schick further discloses "comprising: an antenna; a front end for processing a radio frequency signal received via the antenna" (program source signals received from an antenna, col. 4/lines 58-61); and "digital processing circuitry for processing the digital signal" (col. 3/lines 50-62 for DSP or digital signal processing is included).

Regarding claims 17-32, 34, and 36-37, these claims with same limitations addressed

above are rejected for the reasons given in the scope of claims 1-9 and 35 as disclosed above.

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure: Peterzell et al. and Steckler et al. (in PTO 892 attached) disclose

systems related to mixer and ADC converter.

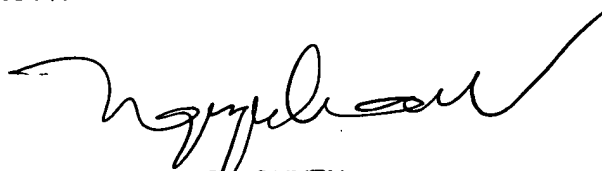5.   **Any response to this action should be mailed to:**

> Commissioner of Patents and Trademarks
> Washington, D.C. 20231

> **or faxed to: (703) 872-9306, (for Technology Center 2600 only)**

> *Hand-delivered responses should be brought to Crystal Park II,*
> *2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).*

6.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Tony Thuan Nguyen whose telephone number is (703)

308-5860. The examiner can normally be reached on Monday-Friday from 9:30 AM to

7:00 PM, with alternate Fridays off.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the **Technology Center 2600 Customer Service Office**

whose telephone number is **(703) 306-0377**.

TONY T. NGUYEN
PATENT EXAMINER

Tony T. Nguyen
Art Unit 2685
January 17, 2005